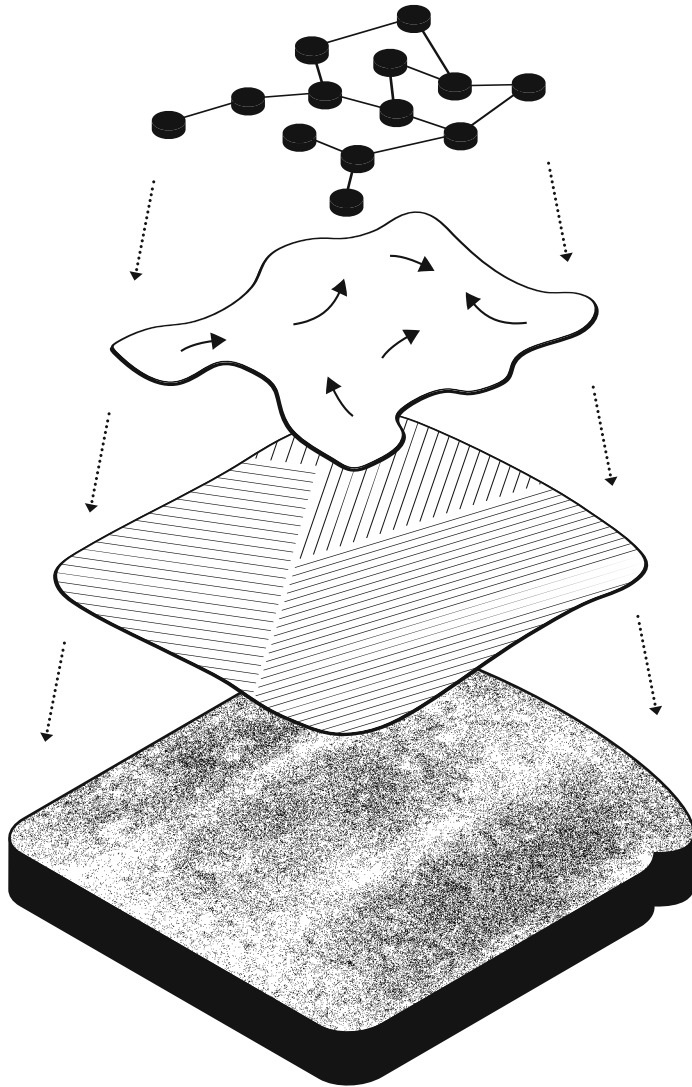


**Design for Transitions:** an Exploration of Practice  
Nando Schmidlin: Master of Arts Thesis  
2018



Advisor: Idil Gaziulusoy  
Aalto University: Helsinki, Finland



**Design for Transitions:**  
an Exploration of Practice



## **Abstract**

This thesis explored an emerging field: Design for Transitions (DFT). In order to tackle the sustainability challenges we face, our society has to be rethought fundamentally. Design teams influence the configuration of technology, products, services and organisations that define how we live; and therefore have been identified as change agents with a responsibility in developing new socio-technical systems. Within sustainability-oriented design, support for innovation on the socio-technical system level has been mostly neglected until recently. The literature on DFT has started to fill this gap. However, so far it is only applied in design practice to a limited extent. Based on the current literature, this thesis identified four key areas in Design for Transitions, which were then used as a basis for qualitative interviews with design practitioners. This led to a proposal of four clusters of activities that connect the current literature with existing processes in design teams: (1) Influence the expectations of clients towards a high innovation level of projects; (2) Build a common experience of the system in question; (3) Carefully design visions to direct the further process; (4) Instead of aiming at final outcomes, build long-term commitment with stakeholders. These clusters support designers in the adoption of DFT in their practice. Overall, DFT was found to resonate with existing processes of design teams. They used its different aspects specifically to create space for socio-technical system innovation. The literature provides a good foundation for a more widespread application of DFT in the future, but further research is needed.

Keywords: Design, Transitions, Practice, System Innovation, Sustainability



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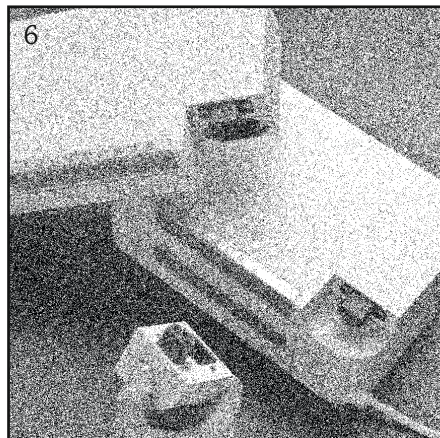
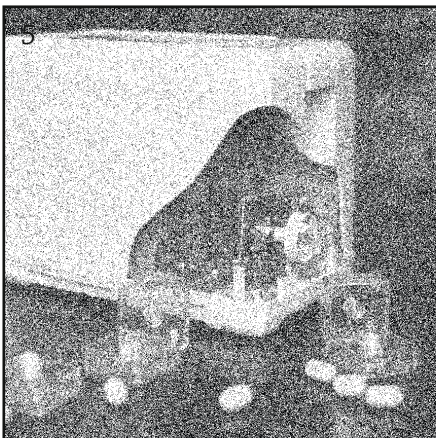
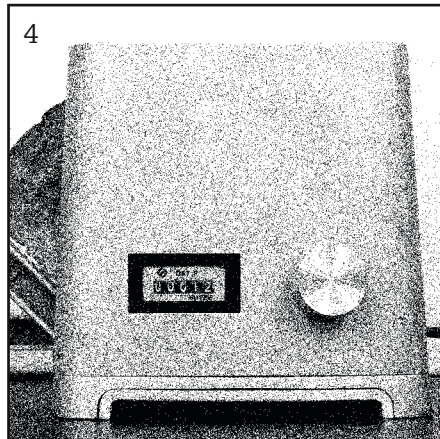
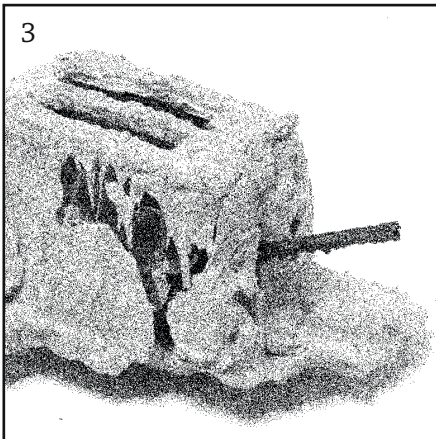
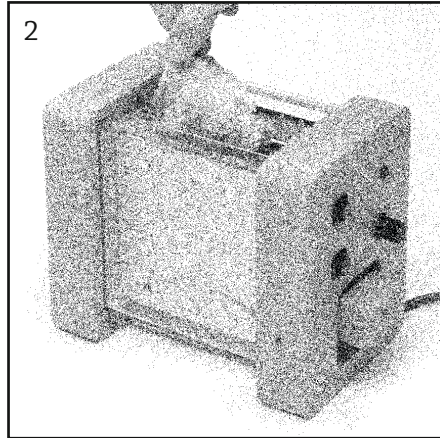
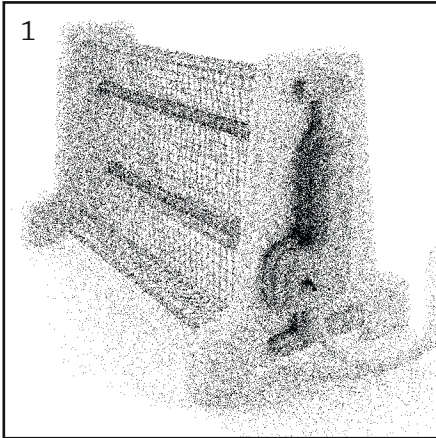
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# 1.

# Introduction

A toaster is a mundane object. The same goes for its ingredient, the toast, in packs of 50 slices. Together they create a crispy sensation at the push of a button, with a waiting time of 216 seconds, until two slices pop out of the toaster. The amount of crispiness can be adjusted with a small knob. There seems little to be perfected about the process of toasting. Nonetheless, young designers have shown an increasing interest in this everyday object (see previous page: Howard (2012) (1); Tiné-Berès (2012) (2); Thwaites (2011) (3); Agency of Design (2010) (4, 5, 6)). What these projects have dealt with is not the function of toasters, nor the user experience of toasting, nor the style of the toaster. They have looked into the system a toaster is embedded in (Shafrir, 2012).

When I started my thesis, I was interested in household appliances, such as kettles, blenders, hairdryers, coffee makers and toasters. Similar to the mentioned designers, I felt uncomfortable with the tremendous rate these products are manufactured and disposed at. The seemingly innocent appliances hide that their cheap prices can only be achieved at the cost of human and natural capital. Still, they provide functions we would not want to relinquish. Alternatives are hardly available, as a consequence we still buy these appliances, but will not reuse, nor repair them, and the laboriously extracted materials are lost.

## **Overview**

When I further investigated the toaster dilemma, I discovered an emerging field in design, called Design for Transitions (DFT). It promises to address some of the shortcomings in the design field in general and in the existing sustainable design approaches. DFT takes insights from literature on system innovations and socio-technical transitions and combines them with the frame of design. Today, DFT can be described as an integration of knowledge from different fields. Three streams of research have been identified to study the field of Design for Transitions. Idil Gaziulusoy, who also serves as an advisor to this thesis, has worked with transitions in the context of production-consumption systems and cities and also studies the role of design in transitions. Fabrizio Ceschin has developed the framework of 'sustainable product-service systems' (SPSS) and studied its embedding in socio-technical transitions. Terry Irwin is head of an educational program named 'Transition Design' and showed a landscape of related theories and methods which inform DFT. The term 'Design for Transitions' (DFT) is used in this thesis and concerns the above mentioned literature, even if they use slightly different terms.

In the design field, DFT is not yet well known. As a personal observation, I sense an increasing interest of designers in systems alongside the motivation to positively impact the planet. Design has often and for long been criticised to do the opposite (Fuller, 1968; Papanek, 1972) and the since then developed eco-design approaches have not brought the desired change (Gaziulusoy, 2015). Nonetheless, facing the unprecedented sustainability challenges of this century, designers are at a key position to create sound and desirable visions of a sustainable future; and to define how these visions manifest in our lives (Gaziulusoy & Brezet, 2015). Existing research has identified DFT as a valuable approach both in the design field and transition processes, but the practice of DFT has to become more widespread if it wants to make an impact on our social and natural well-being.

## **Knowledge Gap**

The field of DFT is emerging. Research is now extensive enough to be applied by practitioners. Recently, conferences, workshops and case-studies have started to spread this knowledge. Design teams are now looking to adopt DFT and seek a connection of its theory to their processes. They encounter different research streams that exist side by side and offer individual frameworks and approaches. Additionally, DFT has a large number of connections to underlying theories and supporting methodologies. As an integrative approach, DFT stands between different disciplines and its

boundaries are still being defined. As a result, orientation in the research landscape is difficult. Gaziulusoy has laid out a future research agenda for DFT. Currently, research is too thin to create general guidelines for various DFT projects. But, design teams need support in adopting insights of DFT and in guiding system innovations (Gaziulusoy, 2015; Gaziulusoy & Ryan, 2017). If design teams aim to achieve systemic impact for sustainability, and want to do so using the knowledge of DFT, they need better orientation of the research landscape and connections to their current processes.

### **Research Aims**

A meso-level framework can fill the described knowledge gap. It connects and associates research outcomes to the context of design teams. From this point, design teams can start to detail their practice of DFT and create project-specific processes using further resources. Therefore, the perspective of design practitioners with introductory knowledge of DFT is important. The following research aims result for this thesis:

- Explore the research landscape of DFT and understand how it impacts the current design practice.
- Highlight ongoing discussions in literature relating to the practice of DFT.
- Propose connections of current knowledge in DFT to existing design practice.



## 2.

# Methodology and Methods

Firstly, an overview of the literature on DFT had to be gained. As an integrative and emerging approach, it was difficult to establish a strict boundary for the literature review. To start, a loose definition of ‘Design for Transitions’ was used to explore the research landscape: literature that combines design processes with transition processes. With this initial overview, three main research streams could be identified. The three streams were selected because they are: (1) approaches where design contributes to socio-technical system innovations; (2) relevant to design practitioners; (3) part of an active and rich discussion. Their literature and the literature they build upon provided the scope for the literature review. The research landscape has to be understood as a network of connected knowledge areas that have different foci and backgrounds. A special emphasis was put on research that could inform a potential DFT process, but which is also under active discussion in the research community. Four such areas for discussion could be identified and are presented in Chapter 4 ‘Key Areas in Design for Transitions’.

It was a research aim to connect the literature to existing design practice. However, the amount of material available about the practice of DFT is small. Based on statements by Irwin and Gaziulusoy, in addition to my own desk research, practitioners in the field are few or nonexistent in a

strict sense. Some practitioners have a good understanding of the literature on DFT, while others do not, even if they use connected approaches. In this situation, it was necessary to collect additional material about the current state of DFT in practice and about its perspective in the future. Semi-structured interviews provide the underlying thinking, ideas and plans of people (Muratovski, 2015). This method was chosen for this context. The basis for the interview structure was the material gained through the literature research, especially the previously mentioned 'Key Areas in Design for Transitions' in Chapter 4. The catalogue of questions (available in the Appendix), together with a summary of the literature research, was sent to the interview partners roughly two weeks before the interview. The aim of this step was to build a common basis for the interviews, which seemed necessary since the participants were recruited from various backgrounds. As mentioned, the sample to choose from was small; thus the selection of suitable interview partners followed an exploratory approach. Using the image of a gap between research and practice in DFT, it was thought that the gap is easier to bridge when it is small. Therefore, it followed two criteria: (1) activity rooted in Manzini's understanding of expert design (Manzini, 2015b) and (2) operation in or as close as possible to the socio-technical system innovation level (Ceschin & Gaziulusoy, 2016).

Through desk research and personal recommendations of people related to the field, 15 suitable candidates could be identified. They worked in Finland or Switzerland for the most part, but also in Sweden, Australia, England or the United States of America. In general, they held positions at design agencies with an international scope, sometimes with multiple locations all over the world. 15 people were approached, whereof nine agreed to an interview. A list can be found in the interview section of the references. The interview process was informal: In the first phase, the background of the participants was recorded and whether they currently participate in DFT projects. Depending on their answer, either a discussion would follow that explored their current processes more deeply, or the potential for DFT in their processes in the future was discussed more speculatively. If possible, the interview was conducted in person, or then through video call, with a duration of 30 to 90 minutes each, in English or German language.

The statements of the interviewees were then transcribed. Individual statements of the participants that responded well to the asked questions were summarised. Clustering was then used to find common patterns among the expert statements (IDEO, 2013). Four clusters were identified and then described as a discussion between the experts. Chapter 5 presents these

findings. With this additional material, the insights of the literature research could be refined and extended. This led to a preliminary meso-level framework that connects findings in literature to the practice of designers. The aim of this framework was to give design practitioners an orientation in setting-up DFT projects, thus lowering the barrier to adopt DFT for existing design teams.





# 3.

# Literature

# Review

## **Sustainability Challenges**

The human society relies on the natural environment of planet earth. Many voices criticise our treatment of this ecosystem. Steffen et al. (2015) have analysed the processes that regulate the earth system and how human activity impacts them. Their concept of 'planetary boundaries' relates different measures to the risk of destroying the foundation of a human society in the future. Three thresholds have already been crossed and are now at a level with high potential to alter the earth system with uncertain and irreversible outcomes for human societies. Raworth (2012) has added social aspects to the concept of planetary boundaries. She shows that the basic needs of millions of people can currently not be met. At the same time, her statistics reveal that the small number of wealthy regions are the largest cause of environmental and social stress. The challenge is to find ways of human living that both satisfy basic needs but also stay within the planetary boundaries. Raworth (2012) calls this the 'safe and just space for humanity'. Most nation-states and many global businesses have understood that we urgently need action. In 2015 the UN Member States approved 17 'Sustainable Development Goals (SDG)' (United Nations General Assembly, 2015). The SDGs now have a wide presence, amongst others in private organisations (United Nations Global Compact, 2017a). However, a recent progress report by the UN Global Compact shows that

only a fraction of the goals for 2030 are likely to be met (United Nations Global Compact, 2017b).

The mature knowledge of the sustainability challenge leaves all of us with an imperative for immediate action - after all, the survival of human civilisation is at stake. This thesis focuses on design practitioners as agents of change. They need support in integrating long-term futures into daily decision making and need to know how they can influence the speed and direction of change.

### **System Innovation and Transitions**

Based on the scale and urgency of the sustainability challenges outlined above, the literature on DFT refers to an area of research that deals with system innovation and transitions. The dictionary describes transition as change from one state to another (Oxford, 2017). For DFT the change on the socio-technical level, which encompasses the social and technological aspects of a society is relevant (Ceschin & Gaziulusoy, 2016; Gaziulusoy & Brezet, 2015). Therefore, transition is defined as the change from one socio-technical system to another one (Joore & Brezet, 2015). The socio-technical system consists of many building blocks. On the one hand, the interactions of the building blocks are the underlying mechanisms of our society and fulfil our needs. On the other hand, the way the system of building blocks is currently configured has many negative effects, both social and environmental (Geels, 2002, 2005). As a result, in order to address the sustainability challenges, change to the configuration of the socio-technical system is necessary (Ceschin & Gaziulusoy, 2016; Gaziulusoy & Brezet, 2015).

For design, dealing with socio-technical system innovation means that it promotes radical changes to the configuration of our society and supports the transition process (Ceschin & Gaziulusoy, 2016). Gaziulusoy & Brezet and Irwin et al. describe the characteristics of socio-technical transitions: (1) non-linearity: cause and effect are not directly connected; (2) co-evolution: transition happens simultaneously in many sub-systems; (3) nested scaling: systems have different levels of scale; (4) emergence: small interventions unpredictably lead to new structures and behaviours (Gaziulusoy & Brezet, 2015; Irwin, Kossoff, Tonkinwise, & Scupelli, 2015). As a consequence, practitioners of DFT have to deal with high levels of uncertainty (Gaziulusoy & Brezet, 2015, p. 560) and the inability to manage or predict the outcomes of their action (Irwin et al., 2015, p. 5).

DFT uses the socio-technical transitions theory developed by Dutch scholars to support an understanding of systems: based on historic cases, they have developed the multi-level perspective (MLP) (Ceschin, 2014; Geels, 2002; Twomey & Gaziulusoy, 2014). The MLP proposes that system innovation originates in small, local, experimental initiatives, referred to as niches. The niche is isolated from market pressure, so more radical ideas can be tested, improved, nurtured and grown. Radical innovations need such a protected space because initially, they often have a low performance and are expensive, so they would struggle in established markets. The MLP highlights the importance of alignment of actors on different system levels. Whether a niche innovation, even if it is well developed, can influence the system, depends on all actors and on how they are aligned with the niche innovation at a certain time. In his work on product-service systems, Ceschin (2012) further articulates the importance of a broad definition of stakeholders in transition projects. On the one hand, transitions benefit from the involvement of all actors that have the ‘power and willingness’ to influence the transition path (inside actors). This includes, partner firms, suppliers, users, but also governmental institutions or research institutions, which create a favourable environment for the system innovation. On the other hand, media, NGOs, foundations, consumer groups etc. with an aligned interest can support the innovation and raise attention to the issue (indirect actors).

In the past, research on system innovation and transitions has not been related to design and the design field has not shown interest in this research (Gaziulusoy & Brezet, 2015). Just recently, this has changed and DFT is part of the research that connects the two perspectives.

### **Role of Design**

To repeat, DFT asks design practitioners to support the transition to a radically different future society. In addition we have seen that designing for transitions is a complex activity. However, the application of DFT in practice is limited today. Furthermore, many disciplines are building societal futures, and system innovation might be possible without the contribution of any design knowledge at all. According to Gaziulusoy, design activity is crucial for three reasons (2015, p. 366f): (1) it will influence how a systemic transformation manifests, through concrete design work on products and services, and through building strategies and visions for organisations; (2) it will develop new technologies and use them in new products and services; (3) it will envision new markets and user profiles. “Design/innovation activity (micro-level change) will significantly influence

the content and direction of change in the socio-technical systems (macro-level change) (Gaziulusoy, 2015, p. 367).” Tonkinwise highlights that a central explanation to unsustainable societies is that design made certain activities and associated products ‘inertial’, meaning design enables certain lifestyles more than others. In the same way, design is crucial for imagining and enabling new lifestyles and practices (Tonkinwise, 2015, p. 86).

This leaves design teams with the responsibility to act as change agents in the development of new socio-technical systems (Gaziulusoy, 2015). Furthermore, they face the complex task of considering long-term, macro level visions and being productive on the short-term, micro level at the same time (Gaziulusoy & Brezet, 2015). This requires developing support for design practitioners to deal with this situation. In the field of design, many tools, methods and approaches have been developed that account for the impact of design outcomes on the natural and social environment. But they are lacking a system innovation perspective. Gaziulusoy writes: “the existing design and innovation approaches do not serve for the purposes of structural, systemic, societal transformations (Gaziulusoy, 2015, p. 375).” Ecodesign tools such as Life Cycle Assessments, checklists or ‘design for disassembly, remanufacturing and recovery’ approaches only improve certain aspects of a product with a technical focus without considering the surrounding systems (Rossi, Germani, & Zamagni, 2016). Product-service systems are a recognised approach to offset environmental impact. But they are difficult to implement because they challenge existing production and consumption patterns, meaning they need support of transition knowledge (Ceschin, 2014). The circular economy is an umbrella concept that many design approaches can contribute to, but it is criticised for lacking the social perspective and mainly focusing on material flows (Ceschin & Gaziulusoy, 2016; Mendoza, Sharmina, Gallego-Schmid, Heyes, & Azapagic, 2017). Design thinking could support the complex transition process because it is focused on collaboration, experimentation and non-linearity. But it lacks a focus on sustainability and puts human needs at its centre without an evaluation of these needs in the context of favourable future systems (Shapira, Ketchie, & Nehe, 2017).

Ceschin & Gaziulusoy (2016) assign existing design approaches that aim for sustainable impact to four levels (p. 120): product innovation; product-service system innovation, spatio-social innovation and finally socio-technical system innovation. Approaches on low levels alone cannot lead to system innovation, but they are valuable if used in conjunction with others. On the socio-technical system innovation level, design creates

long-term sustainable visions and related strategies and activities. These will then inform decision making in designing for all aspects of future societies, like products, services, business models and social practices (Ceschin & Gaziulusoy, 2016, p. 148). DFT is an overarching approach that integrates different areas of knowledge and informs design practice.

How exactly DFT would integrate into existing design practice is just starting to be studied. Gaziulusoy & Ryan (2017) have observed the roles played by designers in a transition case study. (1) On the one hand, design can act as a translator between the stakeholders. Expert designers facilitate participatory and co-creative workshops. They can integrate different minded stakeholders through the creation of new possibilities together with the participants. Thus, working across the areas of expertise is possible. The so called 'dialogic capability' played by designers can shift the discussion towards desires and possibilities, instead of being focused on feasibility of certain visions. They can further enhance the dialogue with the help of visualisations. (2) On the other hand, design is suited especially well to deal with complexity. The context of socio-technical systems requires to work open-ended and iterative, to experiment, explore and adapt on the way. This is commonly attributed to the design process, which has already proven its ability to address so called wicked problems (Brown & Martin, 2015; Buchanan, 1992; Cross, 2001).



# 4.

## Key Areas in Design for Transitions

This chapter presents four key areas that are under discussion in literature on DFT. From the perspective of practice, these areas can be used to inform a potential DFT process, but also have room for further clarification. This room is explored here and forms the basis for expert discussions in the next chapter.

### **Sustainability Goals**

Since sustainable futures are the goal of DFT, it seems necessary to clarify the definition of sustainability in the context of system innovation. According to Gaziulusoy (Gaziulusoy, 2015; Gaziulusoy & Brezet, 2015), only entire systems can be coined sustainable, not system elements individually. Since systems change constantly and we gather more knowledge about the systems as we study them, the conditions for sustainability change constantly, too. This makes sustainability a dynamic and moving target, that can only be defined for certain points in time. Additionally, the strong sustainability model referenced by Gaziulusoy (2015) identifies capital in different areas, e.g. environmental, social, technological and economic capital. The different kinds of capital cannot be substituted for one another. For example the depletion of natural capital cannot be counter-balanced by economic or technological development. From the perspective

of practice, this definition points to bigger complexity behind the characteristics of sustainable futures.

Irwin promotes the detailed concept of ‘cosmopolitan localism’ as orientation (Irwin, 2015; Irwin et al., 2015). According to the description of Manzini (2013, 2015a), cosmopolitan localism takes inspiration from the resilience of natural systems. Man-made systems can be resilient if they form a distributed network of local initiatives that share their knowledge and awareness globally. This is supported by recent technological developments like digitalisation, distributed manufacturing or open-source knowledge. The social components are ‘creative communities’: “people who invent and enhance solutions to everyday life problems by recombining factors that already exist, giving them new functions and meaning (Manzini (2013) p. 4).” These communities might be small, but they connect to a global network. Being small has the benefit of remaining within the human scale. Decision making in small communities has a more direct feedback and can be more open and democratic. From the perspective of design practice, cosmopolitan localism can serve as an inspiration since it builds upon the power of creative communities and new technology, which designers are often familiar with.

### **Inspiring Visions**

The literature on DFT has recognised visions as an important element. Generally speaking, visions are images of a future society (Oxford, 2017). The purpose of visions is “to inform and inspire projects in the present (Irwin, 2015, p. 233).” They create room for discussion about desirable futures that can brake existing assumptions (Gaziulusoy, Boyle, & McDowall, 2013) and initiate dreaming and wondering about what could be (Irwin, 2015). Also, a shared vision aligns the stakeholders and forms the basis for a shared agenda, it can even attract new actors and resources (Ceschin, 2012): “A proper formalisation, presentation and communication of the project vision are crucial to support discussion, negotiation and expectations alignment (p. 177).”

Visions initiate the goal of a transition process and are the basis for further action, thus making their creation a powerful and influential activity. In theory it is possible to imagine an endless number of future visions. In practice, visions are bound to the perspective of their creators. On the one hand, they depend on what is seen as preferable or desirable (Dunne & Raby, 2013). This relates back to how sustainable futures are defined. On the other hand, visions are based on the current perception of mega trends.



Using scenario planning, two recent projects (Leppänen, Neuvonen, Ritola, & Ahola, 2012; Ryan, Twomey, Gaziulusoy, McGrail, & Chandler, 2016) have created different typologies of visions, depending on the trajectories of mega trends. In conclusion, visioning is not a process with a single outcome. According to Dunne & Raby (2013), finding a perfect solution to today's problems in the form of a vision makes no sense. They coined the term 'speculative design' when design is used outside of the market to create material manifestations of future concepts. The artefacts often appear 'real', but their purpose is not to become a reality, rather to expand the room for what could be real. Practitioners of DFT should therefore create the form and content of visions so that they are provocative and inspiring. How exactly this is done depends on the context; and the vision will change over time (Ceschin, 2014).

### **Transition Pathways**

Visions set a goal for a transition process and help in aligning different actors towards that goal. Still, concrete action is necessary to influence system change. Ceschin (2012) presents an embedding process based on scaling-up of niche innovations. It is necessary to design a series of successive steps, a transition path that lays out how the niche can develop to become mainstream. It has to be supported by a network of actors, it has to be improved through learning and experimenting and finally reach a scale where it influences the current socio-technical system, according to Ceschin's framework (2012, 2014). In this way, the vision is connected to the present through a series of intermediate steps.

According to Gaziulusoy et al. (2013), this transition pathway can strengthen a company's ability to link daily decision-making with a far-away sustainable future, thus encouraging active participation in transition processes. For design teams, the transition pathway can also be an entry point to for a systemic sustainability perspective in an existing project brief. With the double-flow scenario method (2013), Gaziulusoy et al. argue that both forecasting and backcasting should be used in conjunction to create transition pathways. If the future is only planned from the present perspective, the current unsustainable activities continue to evolve incrementally, instead of aiming at radical system change. On the other hand, to only start from the future vision and then to create a pathway towards the present might lead to a 'reality gap', where leverage points for change in the current socio-technical system would be missed.

### **Design Attitude**

DFT, especially the use of visions and transition pathways, has serious implications for the practice of design teams. In the chapter 'New Ways of Designing', Irwin (2015) describes how practitioners of DFT are required to see the outcomes of their work as small steps towards a long-term goal. Therefore, solutions build upon work done by others and will be adapted and changed over time; "they have intentionally short or long lifespans (p. 237)". A multi-term design attitude is required, where the design team focuses both on the long-term vision and short-term action at the same time (Ceschin, 2014, p. 262; Gaziulusoy et al., 2013). This means that notions of ownership of ideas, arriving at final solutions and projects with a start and an end come into question. Furthermore, Irwin and Ceschin also mention requirements to work trans-disciplinary and future-oriented (Irwin, 2015); or with building and facilitating actor networks (Ceschin, 2014). These skills are common to activities such as design fiction, service design and design management and therefore not completely new to DFT.

# 5.

## Findings and Discussion

The insights derived from the interviews are presented here as four clusters. Each cluster assembles statements of the experts about a specific topic. The experts have common as well as contrasting thinking, which will be stated. Together, the clusters form a preliminary framework of actions that connect the knowledge of DFT with the existing practice of design teams. The framework covers steps from the initialisation of a transition projects until the first phase of implementation. However, it shouldn't be read as a guideline for future projects, it is an exploration of activities of design teams as of today. The teams engage in projects on different levels, whereof some can count as complete transition projects, some in parts and others could evolve in this direction. This gives an idea of how the knowledge of DFT is currently implemented in practice.

### **Influence the Project Goals**

Most designers are motivated to contribute to a better world, says Andrew Whitcomb (2017). As a design researcher at the design agency Veryday, he has long standing experience with both fellow designers and clients. However, he adds the impact that can be made is often constrained by the project context. Veryday has roots in product and industrial design, but has evolved into a strategic design consultancy with offices around the world, with its headquarters remaining in Stockholm. Recently it

was acquired by the global business consultancy McKinsey. Through all this time, Veryday has worked on projects that are typically an exchange between the agency and their clients. The client's expectations towards a project are crucial for its framing. Veryday's increasing focus on strategic innovation for businesses enables it to influence these expectations and influence the project's frame. This is possible to a smaller extent in product design projects. On the other hand, the purpose of business innovation is often to increase revenue, which conflicts with the general 'doing good' attitude of the agency. In light of its activity with McKinsey, the team at Veryday has put more emphasis on how they communicate its values to clients. So it hopes to align the client's and the designer's goals better in the future.

Meld Studios is a young service design agency located in Sydney. While it also delivers visuals, websites and apps, its focus has become to strategically shape human experiences. Oliver Dykes (2017) has recently joined the team as senior designer. In the interview, Dykes references a design maturity model of client organisations, which Meld Studios uses to better react to clients' expectations. The team assesses how their partners use design and offer a customised process. When it analyses their client's briefings, it often finds that challenges span across the entire client organisation, which is especially true for services. In contrast, the client initially framed the challenge within one product or division. The design team then emphasises the interconnectivity of touch points and complex dependencies. The aim is to turn small projects into longer-term partnerships, because the chance to impact the client in a systemic way is higher. To carefully analyse the client's expectations beforehand helps to start a more strategic conversation and open up the project briefing.

### **Understand the System**

Michel Bachmann is part of the Value Web, a network of experts that consult the organisation of conferences. Starting with a commission from the World Economic Forum in Davos, they design the fundament for decision making with multiple stakeholders, so that instead of talking, the events lead to real action. Bachmann (2017) presented his practice based on 'Theory U'. He applies the theory in three modules that would optimally run for one day each. The team consists of project specific experts, supported by members of the Value Web. The key of the first module, called 'sensing', is that the project group should experience the challenge with all senses. Beforehand, the participants have their own encounters with the challenge. Together, they build a shared relationship to the problem

as a common ground for the project. An example could be an excursion: If the group has come together on the topic of 'maritime pollution', it could visit a coastal village, talk to its inhabitants and even go diving. Bachmann (2017) puts a focus on making a small, local experience of reality, instead of an academic discussion of terms or literature research on the challenge.

The experts shared the understanding that a common ground among the participants of the transition process has to be established. The understanding of sustainability influences the following process, but did not seem to be a good starting point for a conversation. Whitcomb (2017) and Bachmann (2017) discussed the literal meaning of the word 'to sustain', and suggested to aim for circular or regenerative solutions, respectively. They felt that sustainability has become a 'fluffy' and abstract term that is too complex to use in practice. Overall, the experts did not aim for agreement with the stakeholders on the definition of sustainability. Nonetheless, discipline specific language can hinder collaboration. In the experience of Dykes (2017), the specific design language spoken inside their team can be misunderstood by the client. Certainly, this is an issue that requires attention in all projects where different disciplines work together.

As Terry Irwin (2017) puts it, most people could agree that our societies are not heading in the right direction. This is a 'good enough' definition of sustainability to start the process. She is the Head of the School of Design at Carnegie Mellon University in Pittsburgh. Her research is a key contribution to the field of DFT as she has founded a new program at her university called 'Transition Design'. This has resulted in a wide framework about how design education contributes to system change. With longstanding experience at global design firm MetaDesign, she has kept the urge to put things in practice. In Transition Design, tangible action builds upon a theoretical basis in systems. Irwin (2017) says that to develop individual solutions, first you need to find a way to look at the entire system. According to her, there are experts that are building holistic systems understanding, foremost the researchers on socio-technical transitions. But it is a 'big messy task' that can never be fully achieved. Experts of different disciplines will map the system and build a context for subsequent design interventions. In her view, the main issue right now is that the experts are working in their silos of expertise and in separation to design. However, she points to a bigger, underlying issue. Indigenous cultures see themselves embedded in natural cycles and are in harmony with their surrounding system. They already live systems thinking. Modern western societies have lost this ability and have

to re-learn it. According to Irwin, we should build systems understanding back into our lives, through education over the next generations.

Systems understanding is certainly an important part of DFT, but also complex and difficult to apply. Some experts have found assistance in existing methods of strategic design, commonly referred to as 'mapping'. Whitcomb (2017) at Veryday analyses the ecosystem of a service, potentially presented as a large visual map. This map opens up a conversation with the client about relationships between system elements. For example it could reveal a strategic partnership. Thus it is a basis to see the challenge as a collaborative effort, instead of a competitive one. Similarly, Dykes (2017) uses the customer journey map to gain an initial understanding of the challenge. He prefers to use the perspective of the user but also the front-line staff. Clients might confront them with isolated problems, but such a map quickly reveals that services touch many areas of an organisation, and the solution has to be more systemic. However, the two experts also mention that while there is some moving space, it takes experience to not overwhelm the client with the problem, to the extent where it seems unsolvable. The maps are a way to open up a conversation that could lead to new and more systemic projects.

Zeynep Falay (2017) worked at Fjord before taking the role of design director at Hellon Helsinki. The agency has a focus in strategic design, so it will design detailed concepts, but leave the execution, for example websites or interiors, to other agencies. Over time, Falay (2017) has become experienced in a large array of methods and is also familiar with DFT. In a project that requires system thinking, she will select and adapt methods that are part of the conventional design process. She highlights that the system context is challenging in that it is more difficult to deal with and can hardly be simplified. Intuition, that she had seen applied in many design processes, fails in this context, or requires a lot more experience. Also, designers are confronted with highly competent experts of specific problem areas; the designers lack confidence for decision making within the large operational scales that come with DFT. Thus, not the methods as such are specific to DFT, but how and when they are used and adapted.

### **Design Action-inspiring Visions**

Dykes (2017) describes their visioning process as follows: The stakeholders engage in an idea generation workshop and will then prioritise and select the material from the workshop. The design team will take the result and generate a vision in a chosen format. The vision will then be discussed

back with the stakeholders. The aim is to make the stakeholders think differently, but there are certain boundaries beyond which the stakeholders are overly confused. Dykes (2017) has highlighted how the vision can be steered towards being more or less confusing. The design team can ‘sneak in’ aspects that were not brought up in the workshop, but that can lead to interesting questions. The vision itself can represent the complexity of systems in a material form: As a printed visualisation covering a full wall that is simply overwhelming to experience. Some organisations on the other hand struggle and need further guidance. The design team can create a large vision for itself, but only present selected themes to the stakeholders, so that it is easier to comprehend. The visioning process described by Falay (2017) and Whitcomb (2017) is similar. They initialise visioning with an ideation workshop with the stakeholders, which reveals ‘glimpses of the future’, user aspirations and the strategy of the organisation. The design team then further shapes this into a detailed vision. Another potential presentation format are user stories that provide an everyday life context. In this way, visions open up the thinking space and shift the conversation towards a long-term perspective. Yet Whitcomb (2017) adds that the designers involved are often from a similar background: They have been raised in a western state of privilege. This might limit their ability to provide radically different solutions.

One expert wished to remain anonymous, because of his ties to a large service provider in the financial industry (anonymous source, 2018). He directs a small team that uses speculative design to explore desirable futures for their organisation. As a think tank unit, it is independent from the firm at large and not bound to specific pre-defined deliverables. Its goal is to illustrate paradigm shifts and provoke mindset changes within the parent organisation, using design artefacts and probes, but also research papers and presentations. While the focus is their own company, the team can interpret its purpose extremely wide. For the team, visions are positively connoted, non-dystopian futures for the year 2050 with a planetary perspective. In this sense, their purpose is to capture new opportunities in a changing world and hence limit the risk for their organisation to become obsolete. But the interviewee highlights that the focus is being visionary, dreaming and creative. He draws a sharp line to the execution of their visions. Incremental innovation and solutions for current problems are not included in the role of the think tank unit and instead covered by innovation and operation teams within their organisation. For the interviewee, it takes two kinds of characters to create far-fetched, thought-provoking visions and to effectively execute and manage them.

For Mona Mijthab (2017), a vision is more personal. She has studied industrial design, with her graduation project being a sanitary solution for the low-income context. This has developed into a mature NGO which she continues to manage, alongside her teaching activity in design school. A strong intrinsic vision forms the basis to stay motivated in this demanding context, and aids her to represent the people suffering from poor sanitation, even when she does not. This vision can be adapted, but remains relatively stable due to her ongoing effort in the same problem area. According to her, knowing the rough direction is enough to start working. She sometimes uses visions more explicitly with end users. They are asked to draw their ideal home, which empowers them and crosses the lingual and cultural barrier. Some interviewees have come to the conclusion that detailed and shared visions are complex to create and already need to be adjusted once they are finished. Matthias Müller (2017) is directing The Natural Step in Switzerland, a worldwide network of consultants aiming for transitions. Their framework provides a defined set of values to work with. The values are a platform of understanding that is necessary for any further work. A vision can interpret the frame given by the values, but it serves more as a visualisation of them, and is temporal and context-based. Bachmann (2017) prefers creating ‘possibilities today’ in contrast to long-term visioning. According to him, visions create an arduous distance between a personal reality in the present and an idealistic state in the future. It is better to find possibilities in the personal sphere of influence.

### **Build Long-term Commitment**

Literature on DFT promotes transition pathways as a way to link the vision with immediate action. According to the experts, it is not intended to be followed from start to end. Instead, it connects today’s sphere of influence with the long-term vision, but has to be adapted from time to time. So, even if a complete set of events leads from the present to the vision, it is “just a metaphor helping in the process” (Irwin, 2017), making it easier to agree on the first steps. When asked about specific methods to create transition pathways, (Dykes, 2017) and (Whitcomb, 2017) referred to roadmapping. The terminology around roadmaps and pathways is unclear. Both involve a series of events, which lead from the current state to a future state, potentially with links between the events on different levels. In literature, roadmaps are used to map out expected trends and developments (Euiyoung, 2016). In contrast, backwards flowing methods (backcasting) have been used in transition projects. Recently, Gaziulusoy developed a combination of both approaches and implemented this methodology in companies (Gaziulusoy et al., 2013). While the purpose behind



transition pathways seems clear, their role in design practice could be further investigated.

When practitioners use transition pathways as ways to establish agreement and commitment on the first step of implementation, as Dykes (2017) puts it, they are accompanied by the need for ongoing collaboration with a client beyond the first step. Traditionally, design projects are aimed at delivering a solution. The team evolves through design phases which usually include the same activities across different projects. These phases are described in literature and represent a core knowledge of designers. The experts, however, move away from this static process. On the one hand, more and more clients hire design agencies for single phases, for example user research. On the other hand, an intermediate step towards system change is change of the organisational culture. The design agencies of Dykes (2017) and Whitcomb (2017) have already started to react and build long-term relationships to clients. With successive projects, the agencies are able to keep the vision in sight and strategically alter the client's organisational culture.

For Hartmut Heinrich, organisational change has become the main focus (2017). He is leading the Zurich office of the service design agency Fjord that has been acquired by Accenture. As a result, being the digital arm of a global business consultancy, they work for financial clients such as banks and insurances and help them to better understand their clients' needs. But, their innovative solutions bring a new kind of thinking to organisations. This thinking has to be accepted first. Otherwise, the different modes of operation compete and lead to internal tension, which negatively impacts the innovation. Heinrich has realised that a new mentality evolves globally, with a different value set that includes sustainability, healthy living and transparency. The design team's task is to create a committed community that is able to spread these values. This can lead to insecurity in more traditional business branches. On the other hand, companies have to react to these megatrends if they want to stay relevant in the future.

## **Discussion**

The literature on DFT provides design practitioners with an approach to tackle sustainability challenges on the socio-technical system level. This thesis connects the key insights of the main research streams in literature of DFT to the existing practice of nine expert designers. The insights outline the current relationship between theory and practice. Specifically in three areas, research on DFT should support practitioners more closely:

1: The literature on DFT revealed the complexity behind the concrete conditions for sustainable futures. Practitioners are comfortable with using a general understanding of sustainability and are establishing a common ground for action not based on specific definitions, but with a more personal and intuitive recognition of the unsustainable current state of society. In light of the further process of a team, it seemed favourable to make a more human experience of the system they are embedded in, instead of an academic consideration. In addition, the practitioners use different tools and methods borrowed from the field of service design to gain understanding of systems, specifically various mapping tools. Further investigation is needed on how they are used in depth and on whether they are suitable for DFT or should be replaced with refined and specific tools.

2: A key activity in DFT is visioning. The expert designers apply visioning widely and skilfully. They use visions as a form of communication with the stakeholders and carefully assemble the visions accordingly, steering them to be either more provocative or less confusing. This is in line with the literature, but practitioners may abandon the benefit of a participatory vision in order to shape it depending on their needs. In contrast, some experts question the value of detailed shared visions. They argue that agreement on future visions is a lengthy process, during which the system context will have changed already. However, in literature, neither in case studies nor for a majority of practitioners this problem has been described. Literature combines visions with transition pathways, as means to connect long-term futures with immediate action. The vision would otherwise stand on its own in the distance, so the transition pathway is its necessary and important extension that leads to implementation. For practitioners, the transition pathway is only an optional extension of visions. They stimulate commitment of the stakeholders for further action, but system maps and visions also serve this purpose. Even if literature recognises that transition pathways are not static and will be adapted over time, practitioners use them more as a symbol for change, less as a strategic proposal.

3: DFT presents itself as a new approach that also requires a new mindset. Practitioners find the context of systems complex, in that it requires considerable experience and profound expertise. But the designers build on existing skills and adapt them to DFT, without a perceived shift in their underlying attitude towards designing. They have found ways to integrate aspects of DFT into their existing practice as a natural extension of what they did before. The difficulty for practitioners is to find projects with an established focus on socio-technical system innovation. At the moment,

this is the main challenge for the wider application of DFT. Nonetheless, the existing knowledge can be used to create room for transition projects. The practitioners shape the client's expectations with system maps, visions and roadmaps that aim to highlight the fundamental need for system change. In this way, they can establish ongoing partnerships that will create the basis for an upcoming transition project step by step. At the same time, the design teams can build the required experience and expertise over time. This means that the practice of DFT is not yet fully mature, but the current knowledge is a good foundation for its further development.

### **Limitations and Outlook**

For design practitioners who want to apply DFT, this thesis gives an orientation of the current research landscape and how this knowledge could be applied. It cannot give detailed recommendations and is not a guideline. It also shows how differently the knowledge of DFT can be used and aids in finding an individual approach. The insights are built on nine expert interviews. However, the experts were not recruited from a common context, necessarily leading to different answers to the interview questions. This research therefore cannot provide a prototype process for DFT and the statements only apply to their specific cases. At the same time, there might be more elements of practice than appear in this framework. As a researcher, I have counted on personal connections and personal discussion, which introduced a bias as well. While DFT is identified as a very promising approach, further investigation of its practice is necessary. The interviewed experts already work on case projects that could be analysed. An analysis over longer periods will be needed, but would reveal an up-close view of their process, and probably the reasoning behind. This contributes to more depth in research. As the knowledge of DFT starts to spread, more practitioners could be identified, bringing with them their own interpretation and use cases. This leads to a wider perspective of the field of DFT.

### **Reflection**

I contributed much of my effort to aggregate the knowledge necessary to conduct this research. This is not surprising, since the integrative and emerging field of DFT requires an exploratory approach missing clear boundaries and guidance. Therefore, building my own research landscape through literature was a key process, and I was aided by my advisor and the community at my university. On the one hand, I could have started assembling new insights through interviews earlier, and build my research landscape with help of the experts. This could have led to a more creative and less academic approach. On the other hand, I have become much more

confident to present the knowledge of DFT, leading to better discussions in interviews. I enjoyed the freedom to explore literature extensively and meanderingly. Adding knowledge of system innovation to my studies in design strategy was very valuable and I believe it to be a major field of inquiry in future design. While it is a very specialised field, its insights can be framed in various ways for various purposes, also leading to new opportunities for me as a professional, in talks and workshops.

# 6.

## Conclusions

Designers generally want to have a positive impact on their surroundings, and there are many ways to do this. The scale and urgency of sustainability challenges in this century calls for radically new lifestyles, imagined and enabled, among others, by designers. At the intersection of systems and design, a new approach has emerged: Design for Transitions. It is identified as a promising approach to address the global challenges and it seems desirable to apply its knowledge in practice.

In this thesis, chapter 3 introduces the background of DFT following the three current main research streams. It lays out the imperative for immediate action in face of the challenges for humanity. Theories on System Innovation and Transitions locate the challenges within socio-technical systems and provide the foundation for understanding and navigating them. Design teams act as change agents in the development of new socio-technical systems, because the design of products, services and organisations defines how we will live in the future. Design teams need support that goes beyond the existing 'Design for Sustainability' approaches in order to take this responsibility. DFT research has addressed this, but has so far only been applied to a small extent in practice.

In chapter 4, four areas in the literature on DFT are presented that could potentially inform design teams in practice, but also need further refinement: (1) Sustainability values are fundamental to DFT, but the definition of sustainability differs; (2) The creation of long-term and favourable visions has been identified as a key process in DFT. The visions carry the creator's values, knowledge and culture. It remains in discussion, how our preferences can and should influence the visions; (3) Transition pathways connect the vision with today's reality through a series of steps. Research on suitable methods for their creation is still young; (4) The long-term nature of DFT projects demands a different mindset on ownership of ideas and final outcomes which could challenge design practitioners.

Nine experts have been confronted with these four areas, which led towards a meso-level framework in four clusters, presented in chapter 5. (1) The client's expectation shapes the project context, so that transition projects are currently a small part of design practice. But the teams actively influence expectations for future projects in order to engage on the socio-technical system level. (2) To build a common ground, design teams use a variation of existing tools (borrowed mainly from service design) to gain deeper systems understanding. They aim less for scientific results and more for human and visual experiences. (3) Visions represent a core part of DFT. The insights from literature were mostly in line with the expert's opinions. The vision is built through a co-creative process with the client, but the design team will ultimately translate the initial ideas into a tangible format that can be experienced. Thus, it has power to steer the vision into a certain direction. Depending on the audience, the vision needs to be more radical and thought provoking, even overwhelming; or on the other hand simplified and easy to understand. A minority argues that shared visions take too long to create, making them unsuitable for the dynamic nature of systems. (4) Transition pathways then connect the present with a desirable future (the vision), through a series of steps. But transition pathways had a smaller contribution, used by the experts foremost to agree on the next step of implementation, but not as a form of a long-term strategy. Design teams aim to have a more strategic and systemic conversation with clients, but in addition to transition pathways, they use all of the above steps to achieve this, including expectation management, different mapping tools and carefully designed visions. Transition projects are long-term and have no final solution. This benefits design teams because they can collaborate with the same client over multiple project phases.

The four clusters in chapter 5 provide design teams with an orientation when they seek to connect their current processes with the emerging knowledge in DFT. The expert interviews show how differently the existing knowledge can be applied. The clusters therefore are an entry point for design teams to build their own project specific system innovation process. This simplifies the introduction to the multi-faceted research landscape of DFT. As such, this thesis supports design teams to address the sustainability challenges on the socio-technical system level, which leads to a longer-term and more profound impact.

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# **Appendix:** Catalogue of Interview Questions

## **Introduction**

What is your professional history and what is your current role?

Do you consider yourself a designer today? Why?

Have you heard of 'Design for Transitions' or 'Transition Design'?

## **Challenges**

If you were confronted with a systemic challenge (such as food waste, clean energy, over-consumption etc.), what would be the first thing you did?

Are there any guidelines or frameworks you would start with?

Do you currently engage in such projects in your work?

What is your opinion on the discussion about the definition of 'sustainability'?

How do you understand the term 'system'?

What tools or methods do you use to analyse systems?

How is the scope of a suitable stakeholder network defined?

## **Process**

System change is an interdisciplinary activity. What would you personally contribute? What can the design field contribute that sets it apart?

Do you currently use visions or transition pathways (roadmaps) in your work? When and why?

What are the benefits and drawbacks of using visions in projects?

What steps do you take when creating a vision? What has to be done before a team can create a vision?

Visions can be broad or narrow, worldwide or local. Which do you favour?

How does our current world-view play into the visioning process?

Transition pathways connect a vision with actions in the present. What place do they have in your work?

What are the benefits and drawbacks of using transition pathways in projects?

How is a transition pathway different to a (business) strategy?

What additional capabilities are asked from designers in transition processes (compared to traditional projects)? Are they difficult to learn?



**I would like to propose a toast**

From the moment that I decided to continue my education at Aalto University, I have found an excellent education system and study environment. My thanks go to the people of Finland that made my stay possible unknowingly, and more so to the teachers and staff in the IDBM and CS programs. I have made many friends without whom my studies would have been incomplete and which form an integral part of my life. Throughout the course of this thesis, my loved one, my friends and my family provided much needed mental support and gave professional feedback on my drafts. Without the interview partners, this research would not be complete, and they willingly committed their time and knowledge. Last but not least, I could count on a critical and caring advisor.

Nando Schmidlin: mail@nandoschmidlin.ch

Master Program: International Design Business Management

Minor Studies: Creative Sustainability

